



Dampener Brochure

Diaphragm Dampener

1. Product Parameters

Material: UPVC PP PVDF PC SUS304

- Size: 0.35L(20mm)、0.6L(25mm)、1L(32mm)、
2L(40mm)、4L(50mm)
- Diaphragm Material: FPM & PTFE
- Connection form: screw connection
- Pressure resistance: 1.6Mpa 3.0Mpa
- Preflush gas: nitrogen argon

2. Product overview

Diaphragm pulsation damper can reduce 95% of the pulsation generated by the operation of reciprocating pumps such as metering pumps or diaphragm pumps, about 50-70% of the pre-charge system pressure before use, (70%

of the pre-charge system pressure before installing the pump, 50% of the pre-charge system pressure after installing the pump) can avoid system failure. The traditional water hammer phenomenon reduces pipeline vibration, stabilizes flow, and protects precision instruments.

3. Product function

Dampener also known as pulsation damper, pulsation buffer, is a common device to eliminate pipeline pulsation

It is an accessory that must be equipped with metering pumps.

The pulsation damper can smooth the pipeline pulsation caused by positive displacement pumps such as plunger pumps and diaphragm pumps and systemic water hammer.

It isolates the gas from the liquid in the pipeline by a corrosion-resistant diaphragm, through the volume of the gas chamber

Changes to smooth line pulsation.

The main function:

Reduce the damage to the system by removing water hammer.

Reduce peak flow rate fluctuations.

- Protect pipelines, elbows and joints from the impact of pressure fluctuations.
- Create a good working environment for the metering pump and improve the

working performance of the pump.

Allows the system to use smaller pipe diameters, reducing costs.

■ Combined use with back pressure valve can make the pressure fluctuation of pipeline close to zero.

Reduce system power consumption.

4. Volume selection of diaphragm dampener

The hourly flow rate of the pump $\div 60 \div$ the number of strokes per minute of the pump $\times 15 =$ the actual value of the damper actual minimum volume Required

That is, the metering capacity (ml) of each stroke of the metering pump (or diaphragm pump) can be multiplied by 15.

To obtain the minimum volume of the damper required to reduce 90% of the pulse.

Note: (This calculation method is applicable to single-head pulse type pump body, and multi-head pumps are to be discussed separately.)

5. Working principle

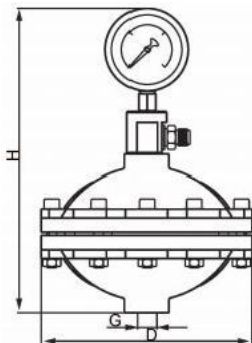
According to Boyle's law $PV_1 = P_2 V_2$, the volume of the gas is inversely proportional to the pressure of the gas, and the pipeline pulsation can be

smoothed by changing the volume of the gas. For a system with a sinusoidal flow rate, at the peak: the volume of the air chamber becomes smaller, and the pulse damper absorbs the excess flow liquid; at the time of the trough: the volume of the air chamber becomes larger, releasing the stored liquid, thereby achieving a smooth pulsation effect.

6. Size table

Model	volume(L)	H(mm)	D(mm)	Size	Pressure MPa	Connection
OVMZ-0.35	0.35	235	φ142	DN15	1.6	Internal thread 1/2"
OVMZ-0.6	0.6	250	φ174	DN20	1.6	Internal thread 3/4"
OVMZ-1.0	1.0	310	φ210	DN25	1.6	Internal thread 1"
OVMZ-2.0	2.0	330	φ280	DN32	1.6	Internal thread 1 1/4"
OVMZ-4.0	4.0	370	φ306	DN40 / DN50	1.6	Internal thread 1 1/2", 2"

7. Dimensions



Air Bag Dampener



Model	Volumn	Pressure	Size	Material	Connection
OVMQ-0.35	0.35L	1.0mpa	DN15	UPVC	Broadcasting, wire mouth, flange
OVMQ-06	0.6L	1.0mpa	DN20	UPvO	Broadcasting, wire mouth, flange
OVMQ-1.0	1L	1.0mpa	DN25	UPVC	Broadcasting, wire mouth, flange
OVMQ-1.5	1.5L	1.0mpa	DN25	UPVC	Broadcasting, wire mouth, flange
OVMQ-20	2L	1.0mpa	DN32	UPVC	Broadcasting, wire mouth, flange
OVMO-3.0	3L	1.0mpa	DN40	UPVC	Broadcasting, wire mouth, flange
OVMQ-4.0	4L	1.0mpa	DN50	UPVC	Broadcasting, wire mouth, flange
OVMQ-5.0	5L	1.0mpa	DN50	UPVC	Broadcasting, wire mouth, flange

Air Bag Dampener Breakdown of Nomenclature

That is, the metering capacity (ml) of each stroke of the metering pump (or diaphragm pump) can be multiplied by 12.

To obtain the minimum volume of the damper required to reduce 90% of the pulse

Air Chamber Dampener



1. Features

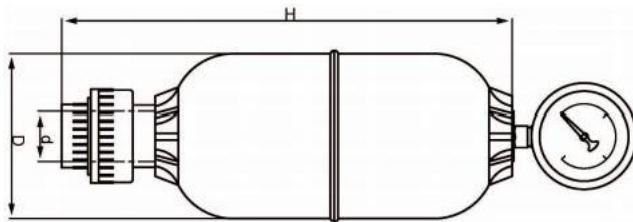
- ◆ Simple structure, economical
- ◆ UPVC material, excellent corrosion resistance
- ◆ Equipped with a diaphragm pressure gauge to prevent the pressure gauge from being corroded

2. Air Chamber Dampener Breakdown of Nomenclature

The metering capacity (ml) of each stroke of the metering pump (or diaphragm pump) can be multiplied by 26 The required minimum

volume of the pulsation damper is obtained.

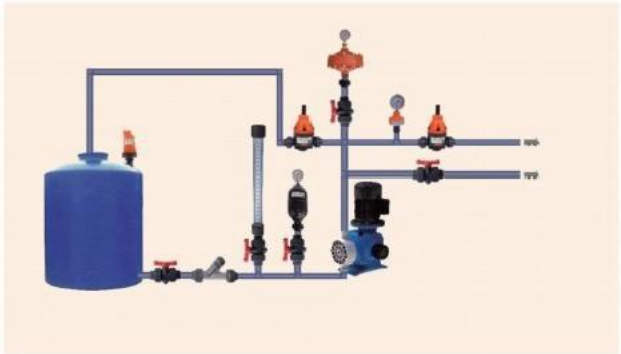
3.Dimensions



4.Size Table

Model	Volumn(L)	H(mm)	D(mm)	D(mm)	Size	Pressure MPa
OVMK-0.6	0.6	201	20	85	DN15/DN20	1.0
OVMK-1.2	1.2	292	32	110	DN25	1.0
OVMK-2.2	2.2	316	40	130	DN32	1.0
OVMK-3.2	3.2	323	50	162	DN40	1.0
OVMK-5.0	5.0	446	50	162	DN40	1.0
OVMK-10	10	760	63	162	DN50	1.0

5. Schematic Diagram of the Installation of the Dosing System



6. Precautions for the Use of Dampener

The maximum operating pressure of the diaphragm pulse damper: PVC PP material is 1.6MPa, forbidden Do not use overpressure to avoid the danger of shell rupture. The best use temperature is 10~45°C. PVDF SUS304 can withstand higher temperature and higher pressure. During installation, collisions should be avoided. Sufficient space should be reserved around the pulsation damper during installation to facilitate pre-charging of the pulsation

damper and future maintenance and adjustment. Shock-absorbing materials should be placed between the pulsation damper and the fixed bracket to absorb the vibration energy of the pulsation damper shell and prevent resonance.

Pre-fill with inert gas (nitrogen or argon) before use, and the pressure is 50%-80% of the average system pressure. If it is installed at the pump outlet, it is recommended to pre-charge 50% of the pressure. If it is installed at the pump inlet, it is recommended to pre-charge 70%. If it is not used for a long time, the pre-charge gas should be released to prolong the life of the diaphragm. It is best not to pre-charge oxidizing gas (such as oxygen), otherwise it will accelerate the oxidation of the diaphragm speed, reducing the service life of the diaphragm.

When in use, the pointer of the pressure gauge should swing slightly, and if the swing is too large, it means that the pressure of the pre-filled gas is too high. If it is too small or the selected model is too small, if it does not swing, it means that the pressure of the pre-charged gas is too low or the pipeline is blocked.

7. Dosing system common problems and solutions

Question 1: When there is no pressure at the outlet of the metering pump, the actual flow rate of the pump is higher than the rated. The flow rate is much larger, and when the flow rate is adjusted, the flow rate basically does not change.

Solution: Install a back pressure valve at the outlet of the metering pump; the back

pressure valve stabilizes the pipeline pressure At the same time, it can stabilize the flow rate of the metering pump and ensure the metering accuracy.

Problem 2: After the pump is turned on, the outlet pipeline vibrates greatly.

Solution: Install a pulse damper at the metering pump outlet (if the metering pump outlet is not There is pressure, it is best to use it with the back pressure valve at the same time), the fluid at the discharge end is due to inertial resistance, The moment the pump starts to run, it will generate pulsating impact force on the pipeline. This is a characteristic phenomenon of reciprocating pumps and is caused by the sudden acceleration of the liquid in the pipeline. The pulse dampener can effectively prevent pipeline vibration caused by pulse.

Question 3: After the pump is turned on, the liquid cannot be pumped out or the pressure cannot be pumped up, and the flow rate is unstable certainly.

Solution: There are many reasons why the metering pump cannot pump out liquid, such as diaphragm damage, pipeline blockage, etc. When the motor and plunger are working normally, the pressure cannot be increased usually because there are impurities in the liquid, which leads to the incomplete seal between the inlet and outlet valve balls and valve seats of the metering pump, so that the pressure cannot be increased and the flow rate is also unstable. Therefore, it is recommended to install a filter prevent impurities from entering the pipeline.

Question 4: (a) The liquid medicine in the liquid storage tank still flows out from the pump head after the pump is stopped (b) A siphon occurs when the metering

pump is dosing.

Solution: Install a back pressure valve at the outlet of the metering pump.

Self-flow is generally because the liquid level of the liquid storage tank is higher than the pump head of the metering pump, so self-flow occurs. The backpressure valve can have effectively prevent self-flow or siphon phenomenon.